Having found the conditions necessary for maintaining a steady arc, and for using the power supplied to it most efficiently, she was able to explain the cause of "hissing," and the causes of certain anomalies in the lighting power of the arc.

For the past four years Mrs. Ayrton has been engaged in investigating the causes of the formation of sand ripples on the seashore.

At the annual dinner, the Norwegian Minister, Dr. F. Nansen, proposed the toast of the Royal Society, and Sir William Huggins responded to it. Speeches were also made by Prof. Hugo de Vries, Prof. Callendar, Lord Kelvin, and the Italian Ambassador. In the course of his remarks, Dr. Nansen said:—

> Ibsen, my great compatriot, has in one of his works formulated the paradox that the man is strongest who stands most alone. There is certainly some truth in this—nay, there is much truth in it so far as science is concerned. The man who, in the search for truth, goes his own way independently of other men and of other considerations, is certainly the man who is apt to find the greatest and most valuable truth. On the other hand, it is also true that science, more than most other things in life, depends on cooperation, on the help of one's fellow-beings, and this becomes more and more true every day. Many people are apt to forget what science actually is, and what they owe to science, for it is through science that modern society actually exists, and the development of society as it is to-day would be impossible if science were eliminated. Humanity is growing, but if science and the means created by science are not growing humanity certainly will have to look forward to a very miserable future. Therefore the nation that wishes to be cared for must support science and those who carry on scientific work. . . . Science will live her own life, and has done so ever since the days when Prometheus made his fatal expedition to the gods and stole the fire which is more or less burning in every one of us, and cannot be extinguished. There is something sublime in this everlasting fire of science. Generation after generation disappear; the individual is nothing, but always "Watchful in the tower man shall remain in sleepless contemplation."

NOTES.

WE regret to have to record the death of Sir Edward J. Reed, K.C.B., F.R.S., on November 30, at seventy-six years of age.

IT is announced that this year's Nobel prize for chemistry has been awarded to Prof. H. Moissan, and the prize for physics to Prof. J. J. Thomson, F.R.S. The prize for medicine has been awarded to Prof. C. Golgi, of Pavia, and Prof. Ramón y Cajal, of Madrid.

THE Physical Society will hold an exhibition of electrical, optical, and other physical apparatus at the Royal College of Science, South Kensington, on Friday evening, December 14. Admission will be by ticket only.

IT is announced that Prof. Gariel has resigned the secretaryship of the council of the French Association for the Advancement of Sciences after having performed the duties for about thirty years.

IT is reported from Bombay that experiments in wireless telegraphy carried out between Landi Kotal and Peshawar have demonstrated the fact that the interposition of higher mountains does not interfere with free communication between two places in a mountainous country.

A JOINT committee has been formed of the county councils of the East and West Ridings of Yorkshire and the county boroughs of Bradford, Hull, Leeds, Rotherham, and Sheffield, to carry out an investigation as to the conditions of the milk supply of the district. The investigation is to be continued for twelve months, and the committee will shortly appoint a bacteriologist to make the necessary examination of samples of milk taken at various stages of transit to the consumer.

THE annual meeting of the German Society of Naval Architects was held in Berlin on November 22 in the presence of the German Emperor. A paper was read by Mr. Boveri on the Parsons marine turbine, in which he gave an account of steam-turbine trials in the German Navy. In the discussion that ensued it was urged that steam turbines possess various disadvantages. They render a ship less easy to steer and control; they are more complicated than ordinary engines; and, above all, they are 60 per cent to 80 per cent. more costly. Notwithstanding these considerations, the large cruiser which is to be laid down next year will be fitted with steam turbines.

No work in medicine is of much use unless it is in living union with the study of the natural history of disease. This was the position taken by Sir Thomas Barlow in the course of some remarks made in opening, on November 28, a new Manchester and Salford Hospital for Skin Diseases. It is only when this purpose is kept in view that any solid advance can be made; it is only by trying to find out the causes and conditions under which diseases come, and by investigating their natural evolution, that real advance can be secured. In devoting a room to study and research, and in fitting it up with modern appliances, the committee of the new hospital has done something to stamp out quackery. In connection with skin disease, English people are very benevolent, but they have not yet learnt, as the people across the Atlantic have learnt, to give money for research; they give plenty of money for asylums and for hospitals, but for research which carries on the study of disease and advances knowledge on sound and progressive lines, that is one of the things which they, practical people as they are, have not yet realised.

THE following are among the lecture arrangements at the Royal Institution before Easter:—Mr. W. Duddell, a Christmas course of six experimentally illustrated lectures on "Signalling to a Distance; from Primitive Man to Radiotelegraphy," adapted to a juvenile auditory; Prof. Percy Gardner, two lectures on the sculpture of Aegina in relation to recent discovery; Prof. A. C. Seward, two lectures on survivals from the past in the plant world; Prof. W. Stirling, six lectures on the visual apparatus of man and animals; Dr. W. N. Shaw, two lectures on recent advances in the exploration of the atmosphere; Major P. A. MacMahon, two lectures on the standards of weights and measures; Prof. W. W. Watts, two lectures on (1) the building of Britain, (2) recent light on ancient physiographies; Dr. C. W. Saleeby, two lectures on biology and progress; and Prof. J. J. Thomson, six lectures on Röntgen, kathode, and positive rays. The Friday evening meetings will commence on January 18, when Sir Andrew Noble will deliver a discourse on fifty years of explosives. Succeeding discourses will probably be given by Sir Almroth E. Wright, Mr. J. J. Lister, Mr. Dugald Clerk, Prof. D. J. Hamilton, Prof. J. J. Thomson, and Prof. G. Lunge.

AT a recent meeting of the Royal Photographic Society Mr. Thomas Manly described and illustrated his modification of carbon printing, "ozobrome," which is rapidly gaining appreciation. The chief advantage of the new method is that carbon prints can be made without any exposure to light if a "bromide" print of the subject is available. The reduction of the bichromate in the carbon tissue is effected by the silver image of the print. It is only necessary to soak the hardened bromide print in water and the prepared carbon tissue or "plaster" in a solution that contains a bichromate, a ferricyanide, and a bromide, to squeegee the two together, and leave them for a short time under slight pressure. The pigment plaster is then separated and treated exactly as if it had been exposed to light under a negative. The silver of the bromide print has been converted by the process into a salt, but by treating it with a developing solution it is reduced to the metal again, and by this round of operations it will furnish "ozobrome" prints until it becomes destroyed by the handling. Mr. Manly indicated a collateral advantage of the method in that it is independent of the colour of the pigment in the "plaster," while by the usual method of exposure to light the effect of the exposure penetrates more deeply in the presence of a blue than of a red or brown pigment.

By the death of Emil Schmidt in his seventieth year a typical German anthropologist passes away. Like many of his fellows he studied medicine, and was actually in practice for some twenty years. He first directed his attention to American archæology, and dealt in particular with the Copper age. His anatomical knowledge led him to take up physical anthropology, and he possessed a considerable collection of skulls, now in the Anatomical Institute at Leipzig, where he was for a time a recognised lecturer, and later extraordinary professor. He was among the first to study the human remains at Pompeii, and a stay in Egypt enabled him to make a further study of early historic material. Some years later he visited India and Ceylon; the whole of the material which he then collected was not published, but his "Reise in Sued-Indien" and "Ceylon" contain much valuable information. In the much discussed problem of the Neanderthal skull he accepted, in opposition to Virchow, the view that it is really that of a lower human species or genus; in the question of prehistoric pigmy races, on the other hand, he held that more evidence was needed as a basis for Kollmann's speculations. In consequence of failing health he resigned his professorship in 1900, and occasional contributions from his pen appeared in *Globus* and other papers, but he knew that his life's work was done, and was seldom seen in scientific circles.

We have received from the author, Mr. J. A. Kershaw, of the Melbourne Museum, a copy of a paper on additions to the fish-fauna of Victoria, published in the *Victorian Naturalist* for October. Not any of the species are new.

The record of fourteen years' continuous breeding of the marsh-warbler in an Oxfordshire parish forms the opening article of the November *Zoologist*, the present year being the first since 1892 in which Mr. W. W. Fowler has been unable to discover a nest of the species. Ornithological notes made in Oxfordshire in 1904 form the subject of an article by Mr. O. V. Aplin, while Mr. E. Selous discourses on sexual selection in the ruff.

The slow-lorisis (Nycticebus) of the Indo-Malay countries, all of which have hitherto been generally regarded as members of a single variable species, are divisible, according to Mr. M. W. Lyon (Proc. U.S. Nat. Mus., No. 1494), into two distinct groups, in one of which a distinct sagittal crest is developed on the skull of the adult, while in the other no such ridge occurs. The second group occurs only in Borneo and Banka, and appears to be further characterised by having only one (in place of two) pair of upper incisor teeth.

Copies are to hand of the second part for 1905, and of the first part for 1906, of the *Verhandlungen des naturhistorischen Vereins* of Prussian Rhineland, Westphalia, &c., published at Bonn. The contents of the former include articles on a peculiar rock, essexit (heptorite), from Siebengebirge, on a portion of the Mayence Tertiary basin, on the ostracods of the Brunswick district, on the extinction of *Planaria alpina* in certain districts, and on some rare or exterminated plants of Rhineland. The issue for 1906 is occupied by the first portion of a synopsis of the birds of the Rhine Province, by Dr. Otto le Roi, of Bonn.

We have received Heft ii. and iii. of the "Meeresfauna von Bergen," edited by Dr. A. Appellöf (Bergens Museum, 1906, pp. 75–233, four plates, and three maps). In the first memoir Mr. O. Nordgaard reports on the Bryozoa of the west coast of Norway; in the second memoir Dr. Appellöf discusses the decapod crustaceans of the same region, with particular reference to their vertical and horizontal distribution. It is shown that conditions of temperature and salinity are of fundamental importance in determining the distribution, though other factors, such as pressure, nature of the bottom, illumination, and chemical composition of the water are also operative.

The origin of species, more especially in connection with variation and Mendelism, forms the leading feature of the issue of *Verhandlungen der Schweiz. Naturfor. Gesellschaft* for the present year. The articles on this subject relate to the evolution of species generally, Mendelism as exemplified by hybridising garden and other snails, variation in butterflies, mutation in the hartstongue fern, and species-formation among bacteria and parasitic funguses. In the case of the garden snail (*Helix hortensis*) Dr. Arnold Lang shows that by crossing members of uniformly yellow-shelled colonies with the fully-banded strain it will be found that the progeny follows to a great extent the Mendelian law in regard to the numerical proportions of the various colour-phases. The issue concludes with a number of biographies of scientific men, accompanied by portraits.

The most generally interesting article in the October number of the *Emu* is one by C. L. Barrett, of Melbourne, on the origin of parasitic habits in cuckoos. It is stated that one American species (*Coccyzus americanus*), which is generally in the habit of building a nest and hatching its own eggs, occasionally lays in the nests of other birds. Another instance of the commencement of the parasitic habit is afforded by the Indian hawk-cuckoos of the genus Hierococcyx, five species of which lay in the nests of babbling thrushes, while the sixth is reported to make a nest of its own. In reference to the frequent resemblance between the eggs of cuckoos and those of the birds on which they are parasitic, the author cites a theory that the food of nestlings has much to do with determining the colour of the eggs which they may subsequently lay. "If such be the case," he observes, "it goes far to explain the similarity between the eggs of many species of cuckoos and those of their foster-parents." The argument is, however, scarcely carried far enough, for it is obvious that, if true, the explanation will likewise apply to "hedgesparrow-cuckoos" and "wagtail-cuckoos" in the case of the European species.

A few days' stay at the island of Ascension when the Scottish National Antarctic Expedition was returning home provided an opportunity for exploration. Mr. R. N. R. Brown furnishes an account of his botanical observations and collections to the second part of vol. xxiii. of the Transactions and Proceedings of the Botanical Society of Edinburgh. Of the four phanerogams regarded as indigenous, only **Portulaca oleracea** and **Euphorbia origanoides** were found, but of the cryptogams collected four provided new records for the island.

A new Russian botanical journal, representing the botanical section of the Imperial Society of Naturalists of St. Petersburg, has been inaugurated under the editorship of Mr. B. Fedtschenko. The first number contains a description, by Mr. W. Sukatscheff, of a new variety of *Pinus Pityusa* from the Crimea, and an ecological account of the flora of the province of the Don Cossacks is contributed by Mr. W. Droboff. A feature of some interest in the latter is the occurrence of *Utricularia minor, Sparganium minimum*, *Eriophorum latifolium*, and other northern types.

Several contributions concerned with the determination of Philippine plants are published as a fourth supplement to the first volume of the *Philippine Journal of Science*. The list of new asclepiads determined by Dr. R. Schlechter includes species of Tylophora, Dischidia, and Hoya, and the same writer describes an endemic Burmannia allied to *Burmannia nepalensis*. The Acanthaceæ were identified by Mr. C. B. Clarke, and the Myrsinaceæ by Prof. C. Mez. Among the second series of grasses named by Prof. E. Hackel are a curious Chionachne and a species of Ischæmum. A second list of ferns contributed by Dr. E. B. Copeland contains, among others, new species of Schizoloma, Athyrium, and Polypodium, and a collated list of Philippine fungi, prepared by Mr. P. L. Ricker, is also published.

In the Transactions of the Institution of Engineers and Shipbuilders in Scotland (vol. l., part i.) there is an able article on the development and present status of the steam turbine in land and marine work by Mr. E. M. Speakman. The author gives some valuable general considerations affecting their adoption, and incidentally points out that, while the solution of the gas-turbine problem does not seem entirely impossible, little or no direct development can be expected until numerous difficulties of a practical nature have been overcome.

A third report on the geological features and mineral resources of the Pilbara goldfield, by Mr. A. Gibb Maitland, has been issued as Bulletin No. 23 of the Geological Survey of Western Australia. It covers ninety-two pages, and is accompanied by seven geological maps and thirteen illustrations. It completes the descriptions of those mining centres in the goldfield to which no reference was made in the previous two Bulletins, and includes full details of the gold-mining districts of Tambourah, Western Shaw, Northern Shaw, and Just-in-Time, as well as of the tinfields of Wodgina and Cooglegong. It contains, in addition, an able summary of the mineral resources and future prospects of the whole goldfield. If prospecting operations are carried on with due regard to the geological conditions, there can be no doubt that the district will continue to be a gold, tin, and tantalite producer. The various tantalates and niobates of the rare earths, which exhibit marked radio-active properties, have been found to occur as primary constituents of the pegmatites such as are found at Wodgina. It is probable, therefore, that careful search may result in the discovery of various radio-active minerals. As minerals of subordinate importance, diamonds, scheelite, asbestos, and argentiferous lead ores are met with. Iron ores occur plentifully throughout the district, but at present such ores, though of high grade, are entirely beyond the reach of commercial enterprise.

Vol. xxxvii. of the *Sitzungsberichte* of the Physico-medical Society of Erlangen for the year 1905 shows a very marked increase in the activity of the society as compared with previous years. The following papers may be noticed as possessing special interest:—a detailed investigation of electric discharges, by Mr. R. Reiger (pp. 1–130); a series of papers by Prof. E. Wiedemann dealing with the history of science, and referring in particular to the early scientific knowledge of the Arabs; details of the determination of the atomic weight of tellurium by Mr. A. Gutbier, and of bismuth by Mr. H. Mehler; and a paper on radio-tellurium by Mr. F. Henrich.

Since the first X-ray tube was constructed by Prof. Röntgen, many modifications have been introduced of greatly increased efficiency. The most recent improvements have been directed to the purpose of making the vacuum adjustable, so as to be able to convert, for instance, a tube which has become very "hard" into a tube of a "softer" character. Mr. Rosenthal, of Munich, describes in the *Verhandlungen* of the Berlin Röntgen Congress, 1906, a new type of tube, in which, it is contended, the character of the vacuum does not undergo variation at all after prolonged working. The principle consists in absorbing all those rays which emanate from the anti-kathode and are not true Röntgen rays, by an internal aluminium "filter"; these rays do not, therefore, strike the glass walls of the tube or produce the customary heating and chemical effects which cause the vacuum to change. It is claimed that the new device is a really substantial improvement, both as regards convenience and economy.

An interesting study of the question whether an enzyme is capable of possessing more than one kind of activity is contained in a paper by Messrs. L. Marino and G. Fiorentino published in the *Gazzetta* (vol. xxxvi., ii., p. 395). It is contended that the maltase of malt, free from emulsin and invertase, is capable, not only of decomposing maltose, but also of hydrolysing the natural and artificial glucosides which are susceptible to the action of emulsin. The absence of the latter in the maltase is held to be proved by the fact that the enzyme recovered after the action of maltase on amygdalin has taken place is almost without effect on salicin, whereas if a trace of emulsin is added to the maltase the enzyme recovered under similar conditions almost completely hydrolyses salicin. The activity of maltase appears, indeed, to be destroyed by the products of the hydrolysis of amygdalin, whilst the latter do not affect emulsin. The maltase of malt seems to be very similar to the maltase of beer yeast, as it is capable, like the latter, of producing the same isomaltose synthetically from glucose; but it differs from it in hydrolysing the β, not the α-glucosides.

The formation of hydrocyanic acid in plants, which was first investigated in the case of bitter almonds by Liebig and Wöhler in 1837, has recently attracted attention owing to the discovery by Prof. Dunstan and Dr. Henry in certain fodder plants, known to cause cattle poisoning, of definite glucosides susceptible of decomposition by specific enzymes with the production of the highly-poisonous prussic acid. In a communication to the Royal Academy of Belgium (Bulletin No. 8, p. 613) M. P. Fitschy adds another half-dozen common plants to the number of those already known to produce prussic acid in the early stages of their growth. Among the Ranunculaceæ are *R. repens* and *R. arvensis*, and among the grasses *Gynerium argenteum, Melica altissima, M. nutans, M. uniflora*, and *M. ciliata*. It remains to be ascertained whether the prussic acid is originally elaborated in each plant in the form of a definite glucoside, and whether a specific enzyme is responsible for its decomposition.

A NEW edition of Mr. Sidney Lupton's "Numerical Tables and Constants in Elementary Science" has been published by Messrs. Macmillan and Co., Ltd. The present issue is substantially similar to the last edition, but a few values have been corrected, and an addendum of two pages contains important values and constants recently obtained.

A SUPPLEMENT to the report of the Rugby School Natural History Society for the year 1905 has been published. It contains a paper by Mr. G. L. Keynes on a late Roman settlement near Somersham, Hunts, and is illustrated with photographs and drawings of the objects found during the excavation of the settlement.

MESSRS. BRADY AND MARTIN, LTD., of Newcastle-upon-Tyne, have issued the seventh edition of their well-arranged catalogue (pp. 700) of scientific apparatus. This enterprising firm is prepared to supply instruments and material for the practical study of all branches of science, and teachers will do well to examine the volume when selecting apparatus or accessories for lecture-room or laboratory.

THE use of models for the teaching of solid geometry forms the subject of two articles by M. Charles Playoust in *Cosmos* for September 8 and 15, the object being to show how easily models can be constructed out of cardboard or with strings by a teacher or student, in cases where the cost of a set of proper models would be prohibitive.

AN English version of Prof. H. Poincaré's articles on "The Value of Science" is appearing month by month in the *Popular Science Monthly*. The November article deals with "The Notion of Space." A German translation of the same book by Prof. and Frau Weber, of Strassburg, has been published by Teubner, of Leipzig.

OUR ASTRONOMICAL COLUMN.

DISCOVERY OF A NOVA.—Circular No. 121 of the Harvard College Observatory contains an account of the discovery, by Miss Leavitt, of a new star in the constellation Vela. This object was discovered on a plate taken with the 1-inch Cooke lens on December 5, 1905, and also on fourteen plates taken between that date and June 29, 1906. Its position, for 1900, is

$$\text{R.A.} = 10\text{h. } 58\text{m. } 20\text{s., dec.} = -53^\circ\ 50'{\cdot}9.$$

On a plate taken on July 12, 1905, showing stars down to magnitude 11·5, Nova Velorum is not to be found, nor did it appear on the 127 plates of this region taken between 1889 and December, 1905, all of which have been examined and found to show stars down to the eleventh magnitude.

So far as can be determined from the Harvard plates, the greatest magnitude attained by this Nova was 9·72, the magnitude on December 5, 1905, and January 26, 1906. There were considerable fluctuations of light during the period covered by the observations, and Prof. Pickering thinks there is little doubt that the object observed is actually a Nova.

COMETS 1906*g* AND 1906*h*.—Observations of these two comets are recorded in Nos. 4135–6 of the *Astronomische Nachrichten*. Observing at Arcetri, Prof. Abetti saw comet 1906*g* as a round, uniform nebulosity of $2'$ diameter, in which neither nucleus nor any trace of a tail could be discerned. Prof. Ambronn, at Göttingen, found a feeble condensation, but no nucleus, on November 19. According to Prof. Nijland, the magnitude, as estimated from an opera-glass observation on November 19, was 7·7.

A set of elements computed by Herr M. Ebell for comet 1906*h*, and published in Circular No. 94 from the Kiel Centralstelle, shows that this body passed through perihelion on September 15. The Circular also gives an ephemeris from November 26 to December 16, which shows that the comet's brightness is decreasing.

OBSERVATIONS OF NOVA SAGITTARII.—Since May 10, 1899, Prof. Barnard has observed Nova Sagittarii on many occasions with the 40-inch refractor at Yerkes, and now publishes the results in No. 4136 of the *Astronomische Nachrichten*. This Nova was discovered from the Harvard photographs, of which one, taken on March 8, 1898, showed it to be of magnitude 4·7. Prof. Barnard's observations gave the following magnitudes for the mean dates of the years named:—1899, mag. 11·0; 1903, mag. 13·8; 1906, mag. 14·8. From these it appears that the Nova may fade entirely from view in the next few years. The published positions of this star seem rather discordant, so Prof. Barnard has investigated the matter, and gives data which will prevent the position of the Nova from being mistaken. The appearance of the Nova in the 40-inch telescope is that of a very small nebula, or hazy star, about $1''$ in diameter. Extending the focus about one-quarter of an inch seemed to improve the definition, but still left the image of the Nova hazy, something like the abnormal stars in the cluster M13 Herculis.

TWO STARS WITH VARIABLE RADIAL VELOCITIES.—From spectrograms taken at the Potsdam Observatory, Prof. Hartmann has discovered that the two stars RZ Cassiopeiæ (an Algol variable provisionally designated 77.1906 Cassiopeiæ) and γ Cassiopeiæ have variable radial velocities. In the former case the spectrograms show a variation between $+33{\cdot}1$ km. (October 1, 1906) and $-111{\cdot}9$ km. (October 4, 1906), the first value obtaining about one-quarter of the star's period before, and the second about the same length of time after, the minimum. The measures of the spectrograms of γ Cassiopeiæ gave values between $+3{\cdot}1$ km. (September 21, 1900) and $-19{\cdot}3$ km. (September 27, 1901). Owing to the hazy character of the lines in the spectrum of this star, the resulting velocities are somewhat uncertain (*Astronomische Nachrichten*, No. 4135).

GRAPHITIC IRON IN A METEORITE.—In an extract (No. 1497) from the Proceedings of the U.S. National Museum Mr. W. Tassin describes the physical and chemical properties of a nodule of graphitic iron found in the Canyon Diablo meteorite. The mass was found on examination to be a septarian nodule, the septa consisting of native metals similar to the mass of iron. The interseptal portions consist of crystalline graphitic and amorphous carbon, mixed with a very fine granular or scaly troilite. There is also present a lustrous metallic substance differing from cohenite in that it is soft enough to leave a mark on white paper, is dark steel-grey in colour, and occurs in angular, foliated masses. Chemical analysis showed that this material contained iron (88·8 per cent.), nickel (4·0 per cent.), silicon (2·0 per cent.), carbon (4·3 per cent.), phosphorus (0·9 per cent.), and a trace of cobalt.

NEW VARIABLE STARS.—In No. 4126 of the *Astronomische Nachrichten* Prof. Max Wolf announces the discovery of thirty-one new variable stars in the region about β Cygni. The variability of these objects was discovered from plates taken with the Bruce telescope with exposures ranging from 150 to 220 minutes. A number of separate charts show the positions of these stars.